Serial No.: 09/500,555
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Version Showing Changes in the Amendment

1. (amended) An array composition comprising:
    a) a substrate with a surface comprising discrete sites; [and]
    b) a population of microspheres comprising at least a first and a second
    subpopulation, wherein each subpopulation comprises a bioactive agent; and
    c) at least one fiducial, [;]
    wherein said microspheres are distributed on said surface.

3. (amended) An array composition according to claim 1 wherein each subpopulation
comprises an identifier binding ligand that will bind a decoder binding ligand _for
identification and elucidation of the bioactive agent._[such that the identification of the
bioactive agent can be elucidated.]

19. (amended) A method according to claim 18 wherein said subpopulations further
comprise an identifier binding ligand that will bind a decoder binding ligand _for
identification and elucidation of the bioactive agent._[such that the identification of the
bioactive agent can be elucidated.]

20. (amended) A method according to claim 18 wherein said subpopulations further comprise
an optical signature _for identification and elucidation of the bioactive agent._[such that the
identification of the bioactive agent can be elucidated.]

28. (new) A composition according to claim 1, wherein said discrete sites are wells.

29. (new) A composition according to claim 1, wherein said microspheres are randomly
distributed on said substrate.

30. (new) A method according to claim 18, wherein said discrete sites are wells.

31. (new) A method according to claim 18, wherein said microspheres are randomly
distributed on said substrate.

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Pending claims

1. (amended) An array composition comprising:
    a) a substrate with a surface comprising discrete sites;
    b) a population of microspheres comprising at least a first and a second
    subpopulation, wherein each subpopulation comprises a bioactive agent; and
    c) at least one fiducial,
    wherein said microspheres are distributed on said surface.

2. An array composition according to claim 1 wherein each subpopulation comprises a unique optical signature.

3.(amended) An array composition according to claim 1 wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.

4. An array composition according to claim 1 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

5. An array composition according to claim 1 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducial, and each of said fiducial is a fiducial fiber.

6. An array composition according to claim 5 wherein at least one of said fiducial fibers has a different shape from the others.

7. An array composition according to claim 1 wherein said fiducial is a defined edge of said substrate.

8. An array composition according to claim 1 wherein said fiducial is a fiducial bead.

9. An array composition according to claim 1 wherein said bioactive agents are nucleic acids.

10. An array composition according to claim 1 wherein said bioactive agents are proteins.

11. An array composition according to claim 1 further comprising a computer readable memory comprising:
    a) computer code that receives a first data image; and
    b) computer code that registers said first data image using said fiducial to generate a
    first registered data image.

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12. An array composition according to claim 11 wherein said computer readable memory further comprises:
 a) computer code that receives a second data image;
 b) computer code that registers said second data image using said fiducial to generate a second registered data image; and
 c) computer code that compares said first and said second data image.

18. A method of making an array composition comprising:
 a) forming a surface comprising individual sites on a substrate;
 b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and
 c) incorporating at least one fiducial onto said surface.

19. (amended) A method according to claim 18 wherein said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.

20. (amended) A method according to claim 18 wherein said subpopulations further comprise an optical signature for identification and elucidation of the bioactive agent.

21. A method according to claim 18 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

22. A method according to claim 18 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducial, and each of said fiducial is a fiducial fiber.

23. A method according to claim 122 wherein at least one of said fiducial fibers has a different shape from the others.

24. A method according to claim 18 wherein said fiducial is a defined edge of said substrate.

25. A method according to claim 18 wherein said fiducial is a fiducial bead.

26. A method according to claim 18 wherein said bioactive agents are nucleic acids.

27. A method according to claim 18 wherein said bioactive agents are proteins.

28. (new) A composition according to claim 1, wherein said discrete sites are wells.

29. (new) A composition according to claim 1, wherein said microspheres are randomly distributed on said substrate.

30. (new) A method according to claim 18, wherein said discrete sites are wells.

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31. (new) A method according to claim 18, wherein said microspheres are randomly distributed on said substrate.